UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,166	12/11/2001	Ghislain Imbert De Tremiolles	FR919990123US1/954-010350	2690

7590 01/12/2005

Clarence A. Green
Perman & Green, LLP
425 Post Road
Fairfield, CT 06430

EXAMINER	
ZHU, JERRY	

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/014,166	TREMIOLLES ET AL.	
	Examiner	Art Unit	
	Jerry Zhu	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Objection

Claim 7, line 1, it is unclear whether the word "unknown" is a part of the claim limitation or not since this word is in parenthesis. This same issue exists in claims 13, 20, and 21.

Specification Rejection

Page 3, line 27, "parameters" is misspelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 7-10, 13-16, and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergstrom et al. U.S. Patent No. 5,794,185 (Bergstrom). Specifically:

Claim 1

2. Bergstrom discloses a method for encoding a input pattern (col.4, lin.15-17; the input pattern is a speech signal) using a normalizer (FIG.1, label 270; col.14, lin.59-67)

and a classifier (FIG.3; col.5, lin.8-15) during learning phase (co.5, lin.16-17, lin.41-45), the input pattern being characterized by an essential feature (col.5, lin.29-32, lin.50-53) and at least one parameter (col.8, lin.30-33) that is susceptible of modifying the input pattern but not the shape comprising steps:

- Establishing a reference value (FIG. 1, label 180; col.9, lin.59-60) for that main parameter (the mean of the single epoch is the reference value);
- Applying input pattern to a normalizer (FIG. 1, label 270; col.15, lin.10-22) that measures the difference between input main parameter and reference value (col.15, lin.23-32) (the standard deviation vector contains the difference between input parameter value and reference value);
- Applying normalized pattern (FIG.1, lab.290, col.16, lin.56-61) and the category (col.16, lin.61-64) to a classifier (FIG.1, label 310; col.18, lin.51-55) (Degree of Periodicity Means contains a classifier (col.4, lin.61-67) and Encode Degree of Periodicity Means contains Degree of Periodicity Means (col.18, lin.51-54);
- Storing the normalized pattern in the classifier (col.16, lin.9-11, the memory location is allocated to the classifier), where the normalized pattern, the category and main factor (col.16, lin.11-14)(the offset is calculated as the difference between mean value and the current input pattern) represent the encoded pattern (col.16, lin.56-64).

Claims 2-4, 8-10, 14-16

9. Claims 2,8,14's "at least one main parameter is a mean value and the main factor consists of an offset used to shift the input pattern to reference value" is anticipated at (col.15, lin.10-22) (the mean value is read from scalar mean vector and subtracted to produce zero mean epochs that is reference value, the main factor is the difference between the excitation waveform, input signal, and the mean value)
10. Claim 3, 9, 15's "at least one main factor is the orientation of the input pattern" is anticipated by *using deviation or main factor to produce a sequence of approximately unit variance contiguous epochs* (col.15, lin.23-32) and claim 3's "the main factor consists of an angle value used to rotate the input pattern to the reference value" is anticipated by *the input pattern is correlated against the reference value to produce an oriented input pattern* (col.15, lin.59-66).
11. Claims 4, 10, 16's "one parameter is the amplitude of input pattern" is anticipated by *one of the spectral parameters corresponding to the segment of speech under analysis* (col.8, lin.30-33) and "the main factor consists of a gain used to modify the input pattern to reference value" is anticipated by "cyclically shift the current epoch in order to maximize ensemble correlation with the ensemble mean, producing a zero-mean, unit- variance, pitch-normalized, shifted epoch." (col.15, lin.61-67)

Claim 7

12. Claim 7's "encoding a new (unknown) input pattern" is anticipated by "input speech which originates from a human speaker," (col.4, lin.16-17) when input speech is originated from a human, it is considered to be unknown as opposed to being known

when retrieved from a memory device (col.4, lin.17-18). Claim 7's "applying normalized pattern to a classifier having normalized pattern stored as prototypes to generate the category" is anticipated at (col.5, lin.47-62). The remainder of the limitation in claim 7 are anticipated in the same way as that in claim 1.

Claim 13

13. The characterization of input pattern in Claim 13's method, the step of establishing a reference value, the step of applying input pattern to a normalizer, and the step of applying normalized pattern to a classifier are anticipated in the same way as that of claim 7.

Claim 13's "prototypes represent the codebook memory of the classifier" is anticipated at (col.4, lin.61-67) where the multi-layer perception classifier calculates degree of periodicity, which is the prototype for the epoch and direct codebook selection and "category and main factor are the identification data of input pattern" is anticipated at (col.16, lin.61-64).

Claim 13's "applying category to codebook memory to extract normalized pattern" is anticipated at (col.20, lin4-40)

Claim 13's "applying the normalized pattern and the main factor to a denormalizer to retrieve a pattern close to input pattern" is anticipated at (col.26, lin.5-28).

Claim 19

14. Bergstrom discloses a system for encoding a input pattern (col.4, lin.15-17; the input pattern is a speech signal), the input pattern being characterized by an essential feature (col.5, lin.29-32, lin.50-53) and at least one parameter (col.8, lin.30-33) comprising:

- means to apply the input pattern (col.4, lin.16-17) to a normalizer (col.15, lin.16-22)
- means for applying a category to an ANN (FIG.1, label 310; col.18, lin.51-55) (Encode Degree of Periodicity Means contains a ANN) (category is produced by Calculate Degree of Periodicity and passed down to Encode Degree of Periodicity Means)
- a normalizer (FIG. 1, label 270) that measures the difference between input main parameter and reference value (col.15, lin.23-32) (the standard deviation vector contains the difference between input parameter value and reference value or the main factor) and sets the input pattern using main factor (col.16, lin.33-36).
- an ANN to receive normalized pattern (col.18, lin.51-58) (Encode Normalized Excitation Means produce normalized pattern to be received by Encode Degree of Periodicity that uses Calculate Degree of Periodicity which contains an artificial neural network, col.4, lin.61-67) and to store (col.16, lin.9-11) the normalized pattern with the associated category (col.18, lin.51-58) (Encode Ensemble Alignment Means characterize the normalized pattern based on the category or class outputted by Encode Degree of Periodicity)

- the normalized pattern in the classifier (col.16, lin.9-11), where the normalized pattern, the category and main factor (col.16, lin.11-14)(the offset is calculated as the difference between mean value and the current input pattern) represent the encoded pattern (col.16, lin.56-64)

Claim 20

15. Bergstrom discloses a system for encoding a new (unknown) input pattern (col.4, lin.16-17; the input pattern is a speech signal), the input pattern being characterized by an essential feature (col.5, lin.29-32, lin.50-53) and at least one parameter (col.8, lin.30-33) (the essential feature can be considered as the shape of the input signal not susceptible to change while the parameter values are susceptible to change) comprising:

- means for applying input pattern to a normalizer (FIG. 1, label 270; col.15, lin.10-22)
- a normalizer (FIG. 1, label 270) that measures the difference between input main parameter and reference value (col.15, lin.23-32) (the standard deviation vector contains the difference between input parameter value and reference value or the main factor) and sets the input pattern using main factor (col.16, lin.33-36).
- a classifier storing normalized patterns (col.16, lin.9-11, the memory corresponds to the classifier) associated with the category of the normalized pattern (category relates to an essential feature previously defined) to generate the category of the normalized pattern. (col.16, lin.56-64) (the class corresponds to the category)

Claim 21

16. Bergstrom discloses a system to decode a new (unknown) input vector (col.4, lin.16-17; the input pattern is a speech signal) during classification phase, the input pattern being characterized by an essential feature (col.5, lin.29-32, lin.50-53) and at least one parameter (col.8, lin.30-33) (the essential feature can be considered as the shape of the input signal not susceptible to change while the parameter values are susceptible to change) comprising:

- means for applying input pattern, a normalizer, and a classifier are anticipated in the same way as in claim 20
- means for applying the category of the normalized pattern to the codebook memory of the classifier (col.20, lin4-40)
- means for extracting the normalized pattern corresponding to that category form codebook (col.20, lin4-40)
- a denormalizer to receive main factor and normalized pattern to retrieve a pattern close to the original input pattern (col.26, lin.6-28).

Claims 22

10. The method of claim 1 is executed in a computer. Writing computer software product to execute a given algorithm or method can be done by anyone skilled in computer programming alone. There is no new patentable content or new limitation added to claim 1. Therefore the rejection of claim 1 also applies to claim 22.

Claim 23

11. The method of claim 7 is executed in a computer. Writing computer software product to execute a given algorithm or method can be done by anyone skilled in computer programming alone. There is no new patentable content or new limitation added to claim 7. Therefore the rejection of claim 7 also applies to claim 23.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 5-6, 11-12, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom, as applied claims 1, 7, and 13 above respectively, in view of Steimle, U.S. Patent Number 6,377,941 (Steimle). Specifically:

Claims 5, 11, and 17

13. Bergstrom teaches a speech encoding and decoding method and apparatus with an artificial neural network (ANN) based classifier to receive input data. Bergstrom fails to teach a classifier using the input-space-mapping algorithm that computes the

distance between input pattern and stored prototypes known as K Nearest Neighbor (KNN) mode.

Steimle teaches methods and circuits of ANN that automatically computes the distance between input pattern and stored prototypes according to KNN mode. (col.3, lin.60-67; col.4, lin.1-7)

One of ordinary skill in the art would have provided the classifier, the learning system, taught by Steimle, for the purpose of computing the distance between input pattern and stored prototypes according to KNN mode. As a result it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the invention taught by Bergstrom by implementing the classifier using input space mapping algorithm based on KNN mode as taught by Steimle as set forth above.

Claims 6, 12, and 18

14. Bergstrom teaches a speech encoding and decoding method and apparatus with an artificial neural network (ANN) based classifier to learn input data. Bergstrom fails to implement the classifier using at least one ZISC neuron.

Steimle implements ANN circuits using ZISC neuron for the purpose of computing the minimum of the distance between an input vector and a prototype.

One of ordinary skill in the art would have used a ZISC neuron as taught by Steimle, for the purpose of computing the minimum distance between an input vector and a prototype. As a result it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the invention taught by Bergstrom as taught by Steimle as set forth above.

Claims 22 and 23

15. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom, as applied claims 1, and 7 above respectively, in view of Agarwal, U.S. Patent Number 5,729,691 (Agarwal). Specifically:

Bergstrom teaches a speech encoding method to encode input signal. Bergstrom fails to teach how to implement the method using computer readable program code to execute each step in the methods.

Agarwal teaches a computer-implemented process, apparatus, and storage medium encoded with machine-readable computer program code for encoding input signals (col.2, lin.50-61)

One of ordinary skill in the art would have used a computer program code for encoding input signals as taught by Agarwal, for the purpose of implementing

encoding input signals method using computer program code. As a result it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the invention taught by Bergstrom as taught by Agarwal as set forth above.

Conclusion

The following references are considered to be pertinent to applicant 's disclosure.

Niki is cited to show an ANN based method and apparatus to categorize patterns from pattern feature data derived from input patterns into one of plural categories.

Nguyen is cited to show an ANN based signal classification system and method using an ANN based learning system that performs both supervised and unsupervised learning which is particularly related to present application that considers both known and unknown input patterns.

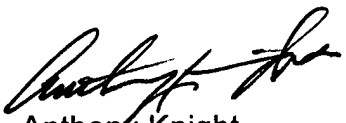
Bax is cited to show validation of nearest neighbor classifiers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Zhu whose telephone number is (571) 2724237. The examiner can normally be reached on 8:30 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jerry Zhu
Examiner
Art Unit - 2121
Monday, December 06, 2004



Anthony Knight
Supervisory Patent Examiner
Tech Center 2100